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ABSTRACT

This paper presents findings on predictive models used to identify student characteristics associated with persistence and success in the Administration of Justice (ADJ) program at Blue Ridge Community College (Virginia). Data mining was used to discover patterns and relationships in the data, and analysis was performed using the SPSS program, CLEMENTINE. The sample consisted of students in introductory classes in the ADJ program (n=139) and transfer students (n=386) in similar introductory courses. Through an inductive process of examining data, certain unexpected factors were found to be predictors of student success in these courses. Besides the student's GPA, factors like the cumulative hours attempted and cumulative hours completed without the ADJ courses were significant. It appeared that students who had more credit hours before entering the ADJ classes showed higher rates of persistence; therefore, new students were more at risk. Additional analysis using a neural network model revealed the relative predicting power of various student characteristics. Included in this analysis were variables such as age, race, financial aid awards, and participation in developmental education programs. From this exploratory approach to analyzing data, findings have informed the institution's knowledge of its faculty, programs, and students. (JCC)

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ED 463 792

A Model to Marry Recruitment and Retention: A Case Study of Prototype Development in the New Administration of Justice Program @ Blue Ridge Community College.

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INTRODUCTION

Each year the Blue Ridge Community College Planning Committee, advised by the first author, and chaired by the second author, addresses a number of issues that are neither federal nor state mandated. In 2000, the authors pursued a study on the relationship between sex, age, and grade point average. It was no surprise that young males were high risk. They are high risk everywhere they go in our society. (e.g. http://www.albany.edu/sourcebook/1995/pdf/t44.pdf and http://www.albany.edu/sourcebook/1995/pdf/t48.pdf.

Levin's primary interest was to 'irritate' his colleagues, and secondarily to show them that numbers had meaning. Within a short period of time, it became apparent that the faculty and staff were not using the data available. In order to change the campus culture, change in and how we thought about and used data was necessary.

The research team was aware of some problems that might be amenable to data analysis, and IR had a brand new software package that had not been put to the test. Using Dr. Levin's insight into the Administration of Justice (ADJ) Program experience, (a new program that has grown from a few ad hoc courses to two certificate programs in 2000-2001) the research team started out with two problems.

1. Attrition in ADJ 100, Introduction to Criminal Justice, seemed very high. Many students were not succeeding in the course, and experience in business has demonstrated that it is usually easier to keep a customer than to get a replacement customer.

2. Information on what measures predicted student success or retention in this discipline was nonexistent.

What happened proved to be a synergy between instruction and institutional research. Serendipity ruled, in this project as well as many others. While the primary findings are of great interest and provide a path forward for the Administration of Justice Program as well as a model for the institution, some of the "by-the-way" findings were as important.

Details about the study process, findings, and implications follow.

METHODOLOGY

Given the problems identified above, it was decided that the program head needed a predictive model that would differentiate between those students who can succeed and persist in the ADJ Program versus those students who are not likely to succeed or persist. This would enable the program/college to better retain those students who enroll, and recruit future students with a greater probability of success.

Uncharacteristically, the authors sought to use an inductive process to uncover the successful student identity in the ADJ Program. They decided to implement a data mining process to discover patterns or associations in the data that could be useful in making valid predictions. The research design is a modification of the data mining process exemplified by the Two Crows Corporation (1999).

The design included the following tasks:

1. Identify a study cohort of students enrolled in ADJ 100, Survey of Criminal Justice, or SOC 235, Juvenile Delinquecny for fall 1999 and fall 2000. Both courses qualify as introductory courses in the new ADJ Program. However, students from other programs could also select these courses to meet their elective requirements.

   Initial observations found a potential difference between the two cohorts of students. However, a t-test of student grade point averages supported the hypothesis that any difference between the groups was due to chance alone. Therefore, the data for these students were merged to generate one cohort of 139 records.

   For validation purposes, a dataset of transfer students (386) in similar introductory courses was identified. The courses selected were PSY 200 (Principles of Psychology), and SOC 200 (Principles of Sociology). The predictive model created for the ADJ program would also be run on the transfer dataset to observe any major inconsistencies or invalid assumptions.

2. Create a dataset. Extract demographic and academic variables from the Virginia Community College System Research & Assessment Data Support System (RADSS) to describe students in the introductory courses, ADJ 100 or SOC 235 for fall 1999 and fall 2000. A download process selected variables from the student information system (RADSS) as a flat file.

   Originally, the intent was to seek a better understanding of the relationship between demographic and/or academic variables and the student's success in follow-up courses in the spring semester. However, the N being so

mall in the follow-up courses, the design was modified to predict a student's success in selected courses offered during the fall semester. This required a modification of several variables, such as creation of a fall grade point average, which did not include the selected study courses.

Here is one occasion where serendipity ruled. In order to calculate the Grade Point Average without the ADJ course data (new variable, GPAMOD), it was necessary to include variables such as hours attempted, hours completed, and grade points in the dataset. As a result, these variables were included in all future analyses and proved surprisingly informative.

Student grade and student success were the dependent variables. The latter was a bimodal variable created to represent student success (A,B,C grades), and student non-success (D,F,W). New variable, GRDGRP (grades grouped).

3. Describe the data, that is summarize its statistical attributes (such as means and standard deviations), evaluate data charts and graphs, and look for observations where meaningful correlations appear to occur together. The use of descriptive statistics was useful in clarifying that there were some variables with correlations > .30 between a student's grade and variables such as hours completed, grade points, hours attempted, and grade point average. Despite the usual deductive techniques, traditional analysis was informative, but inconclusive.

4. Seek patterns and relationships among the data using data mining tools such as a decision tree or rule inductions. Explore the capability of using a neural network to improve the probability of predicting success of students.

Data mining has been defined as a "process that uses a variety of data analysis tools to discover patterns and relationships in data in order to make valid predictions." (TWO CROWS, 1999) The research team wanted to identify patterns of data that cannot be output by traditional statistical techniques. To do this, we chose the SPSS program, CLEMENTINE. It was hoped that this new inductive technology would identify variables appropriate for predictive modeling. It was the first time that the team had considered application of a data mining tool to a problem in our higher education environment. Little did the research team know the extensive learning curve on which we were about to embark, nor the bountiful findings that would result. TWO CROWS corporation said it correctly when it stated that "data preparation steps may take anywhere from 50-90% of the time and effort of the entire knowledge discovery process."(1999) Patience is a virtue, especially in data mining.

5. Build a predictive model. The goal was to build a model that was an overall representation of the process underlying a student's success in the ADJ introductory courses. This model would be based on patterns determined from known results. The team used rule induction analysis[1] and neural network[2] techniques to establish those characteristics that would tend to forecast success and retention. These characteristics/variables would define the elements of the new model.

6. Test the model on results outside the original sample. As mentioned, the research team created a similar cohort of College Transfer (CT) Program students. The larger dataset demonstrated even more strongly how valuable predictive modeling can be in support of academic decision making. The analysis expands on this thought.

7. Empirically verify the model. This is a future phase in the ADJ model development. It is anticipated that the program head will select those students identified as successful in the summer or fall ADJ courses, and survey them in order to determine if their success(as deemed successful by the model) will predict their continuation in the program. The question is whether predictors, such as, hours completed, and/or success in the introductory ADJ courses will help forecast program enrollment.

8. Based on results, decide whether the model is actually a good predictor, or whether it needs to be recalibrated.

ANALYSIS: The Quest for Predictors of Successful ADJ Students

In the first phase of analysis, the research team looked for those factors, which had a strong relationship with a student's success. Demographic and instructional characteristics were correlated with the bimodal student success variable, GRADEGRP,

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[1] Rule induction converts data into a series of "if-then" rules or a rule set, which shows the information in a very comprehensible form. It is important to note that the process outputs only those factors that really matter, while others are discarded. This process is helpful if one wants to see how variables/groups of items relate to one conclusion, or dependent variable. It can also output a decision tree which is useful if one wants to see how variables/factors in the data "split" the population in subsets that are relevant to the problem (not necessarily the predefined outcomes). (Introduction to CLEMENTINE; SPSS Inc.)

[2] A neural network is an extremely simple model of the way the nervous system operates, using the basic unit of neurons in layers. Input data are presented to the first layer and values are propagated from each neuron to every neuron in the next layer. At first, all are random, but the network learns through training. Examples for which output are known are repeatedly presented to the network and the answers it gives are compared to known outcomes. Information for this comparison is passed back through the network, gradually changing the weights. The process usually becomes more accurate and through sensitivity analysis, it prioritizes the factors under study. (Introduction to CLEMENTINE; SPSS Inc.)

i.e., student success = A,B,C, in the introductory ADJ course, and student nonsuccess = D,F,W.

Correlation with GRADEGRP was significant at the 0.01 level (2-tailed) for

		Strength	Signif.
CUMHCMOD	Cumulative hours completed w/o ADJ course	.316	.000
CUMGPMOD	Cumulative grade points " " "	.344	.000
CUMHAMOD	Cumulative hours attempted " " "	.233	.006
GPAMOD	Grade point average " " "	.351	.000

In the College Transfer Program, correlation was significant at the 0.01 level for the same variables, and additionally for AGE. Since these variables, except for GPAMOD, were not the typical demographic correlations that one expected, the findings encouraged the research team to include these variables in any further analysis.

CROSSTABS analysis with both GRADE and GRADEGRP was meaningless in most instances, as data were discrete, and the cell numbers were too prolific.

The research team did find that SEX, RACE, FINAID, FULLPART(time), ONOFF(campus), or enrollment in DAYNITE classes did not help explain a student's GRADE or GRADEGRP in the ADJ introductory courses. There were no significant Chi-square lambda values for any test.

Similar analysis of the College Transfer dataset found that SEX and RACE were in fact significant in improving the probability of predicting a student's grade. Only SEX was significant, using Fisher's Exact Test, at the 0.005 level, for predicting a student's success when GRADEGRP was the dependent variable.

Because there was limited interval level data, predictor models using regression analysis were handicapped. However, regression analysis was one more classic tool used in the search for explaining student success. The research team found that this model explained approximately 25 percent of an ADJ student's success using GRADEGRP as the dependent variable. The same model explained 33 percent of the College Transfer student's success. Taking this technique one step further, stepwise models displayed some interesting priorities in the order of the predictors.

Table 1: Stepwise Predictor Models for ADJ and CT Programs

Administration of Justice	*College Transfer*
1.GPAMOD	1.CUMHCMOD
2.GPAMOD,CUGPMOD	2.CUMHCMOD, CUMHAMOD
3.GPAMOD,CUMGPMOD,and CUMHAMOD	3.CUMHCMOD,CUMHAMOD, and CUMGPMOD
4.CUMGPMOD,CUMHAMOD	4.CUMHCMOD,CUMHAMOD, and CUMGPMOD, AGE

5.CUMGPMOD,CUMHAMOD, and CUHCMOD

5.CUMHCMOD,CUHAMOD, and CUMGPMOD,AGE, and GPAMOD

6.CUMHAMOD, CUMHCMOD

These findings concluded our traditional analysis. Admittedly, there was some preliminary information available. 'Yes, Virginia, Grade Point Averages do help explain student success.' But more interesting was the role that Cumulative Hours Attempted (CUMHAMOD) and Cumulative Hours Completed (CUMHCMOD) without the ADJ courses appeared to play in a student's success. The downside was that there was very little information about where the breakpoints were for GPAs, or the number of hours that were relevant to the issue at hand.

This is where traditional analysis breaks down, and data mining enters. With data mining, there exists a series of inductive tools at hand to further explore relationships as well as confidence levels that could better clarify the issue. There is no doubt that the impact of data mining activities is different and perhaps more arcane than traditional statistics. David Hand charges that data mining focuses on description and algorithms, whereas modern statistics are heavily model-driven. He purports that ..."because the development of these algorithms is in the absence of a unifying theoretical underpinning analogous to that underlying statistical modeling, the discipline is in danger of losing direction."(Hand, 2000, pp. 444,448)

While the potential for spurious patterns exist, missing data are a problem, and the significance of data mining in sectors such as education have yet to be vindicated, nonetheless, the opportunity for increased knowledge abounds. The authors refer the reader to Hand, and the article's list of references for a comprehensive discussion of the validity of data mining for modeling purposes.

Recognizing its limitations, the authors proceeded to select several 'supervised learning' (outputs are predetermined) models to assist in the prediction of ADJ student success. As discussed earlier, the Rule Induction Model was a favorite choice, given its ease of use, flexibility with nominal and interval data, and humanistic, easily interpretable, and understandable data presentation.

Using the bimodal GRADEGRP variable as the output variable in the ADJ student success analysis, the research team found that a GPA of 2.0 was the defining point for predicting success in the ADJ introductory courses. The model predicted success (A,B,C) in the ADJ course with 75 percent confidence for those students who held a GPA >=2.0. The model also proposed that students who were taking classes on-campus were more likely to succeed.

Table 2: ADMINISTRATION OF JUSTICE RULE INDUCTION MODEL

```
Rules for 1:                          {1=D,F, or W grade}
    Rule #1 for 1:
        if ONOFF in [1 2]             {1= Off –campus, 2= Both On- and Off-campus}
        and GPAMOD <= 2
        then   1   (42, 0.659)        {42 students/65% meet these criteria}


Rules for 2:                          {2=A,B, or C grade}
    Rule #1 for 2:
        if ONOFF == 0                 {0=On-campus}
        then   2   (3, 0.8)

    Rule #2 for 2:
        if CURRIC in {Mgt, Upgrade Skills, Arts & Science, Admin of Justice...}
        and GPAMOD > 2
        then   2   (95, 0.753)

Default :      1
```

The GPA finding of > = 2.0 was much lower than anticipated. It is here that an interactive process between the instructional side of the house, and the institutional research arm became more important. IR has the capability to generate and filter through a dataset and identify items of general interest. It is the domain expert, i.e., someone knowledgeable about the content of the dataset and having an intuitive understanding of its trends, who can help interpret the output patterns so voluminously produced by this technology. In this study, the domain expert, also known as the ADJ program head, interpreted GPA factor of > = 2.0 to mean that the courses were not difficult, and attrition was less likely to be due to the student's academic skill level.

Not surprisingly, students enrolled in several curricula also demonstrated consistent success. Examples were: Arts & Science (CT), Administration of Justice, Management, and Non-degree seeking students.

A nagging question about lack of success or attrition always come to fore. By using a student's grade as the output variable, we were able to discern those characteristics that are most likely to influence poor performance versus withdrawal. For example, of those students with a GPAMOD < = 3.214, there was a one in three probability that they would receive a C grade. However, of those students with a GPAMOD < = 3.214, and having completed more than one, but fewer than 10 credit hours, there was a one in two probability that they would earn a C grade. Therefore, new students were more at risk.

The data on students who withdrew was even more enlightening. For example, of those students who carried less than 13 credit hours, were Day students, in the College Transfer Program, and had completed less than 46 hours - 41 percent Withdrew from the course. It was suspected that these students were enrolled in these courses as electives, and ADJ program classes were among the first to be dropped by non-majors.

Rule Induction Modeling also offers a Decision Tree alternative. This technique splits the population into subsets that are most relevant to the problem. For the issue under discussion, the model split the data by GPAMOD <= 2.0, that is, grade point averages without the ADJ course less than or equal to 2.0. This model reinforced the if-then rules previously described. Interestingly, when the Decision Tree Model was employed with the College Transfer dataset, the population split was based on the variable Cumulative Hours Completed without the introductory college transfer courses PSY 200 or SOC 200 i.e. CUMHCMOD < = 11. College Transfer students who had completed less than 11 hours prior were less likely to succeed. Ninety-seven percent of those students who had completed more than 45 hours succeeded in the courses under study.

The Rule Induction Model greatly expanded the knowledge base for this study. But the research team wanted to push the envelope, and moved on to exploring the data with a Neural Network Model. By constantly "retraining" itself, the model developed a 76.62% capacity for predicted accuracy of ADJ student success. One strength of a neural network model is the ability to show the relative importance of a study's inputs. Unlike regression analysis that usually analyzes a small number of factors at a time, neural networks can evaluate limitless factors and create a non-linear combination of the values of the nodes. The output values are between 0.0 and 1.0, with the average being .33. These values express only the relative importance of the factors.

In our study of the ADJ student success the model identified the following levels of relative importance of the inputs.

Table 3: ADJ Student Success Neural Network Model : Relative Importance of Inputs
(List of variables attached)

GPAMOD	0.44377

DVLPMNTL	0.35300
FINAID	0.30517
CURRIC	0.27280
RACE	0.24703
TERM	0.14274
ALGGRP	0.13924
DAYNITE	0.11718
AGE	0.11718
ONOFF	0.10694
ARTHGRP	0.10637
CUMHCMOD	0.09228
ALGEGRA	0.09010
CUMGPMOD	0.08870
ARITH	0.07979
CUMHAMOD	0.06631
SEX	0.06350
LOADCR	0.04688
FULLPART	0.02036
XFERHRS	0.01192

These output values demonstrated that a student's GPA was half again as important in predicting success in the ADJ courses as whether or not he/she received financial aid, twice as important as a student's race, and four times as important as a student's age.

In this model, a student's developmental status appeared as an important predictor. GRADE level analysis of the Rule Induction Model demonstrated that a student's participation in the developmental program seemed to protect him/her and reinforced success in the ADJ program courses. While past assumptions might have predicted that students in developmental courses would not fare as well as other students, these findings disprove that assumption.

IMPLICATIONS

Although there had been no notion that this analysis would improve the quality of instruction, the research team was proven wrong. For example, as a result of some patterns that CLEMENTINE detected – patterns that seemed counter-intuitive – the research team found that the program had an adjunct faculty member who was ineffective. Specifically, while he received excellent student ratings, he was issuing A's to any student who attended to the end of the class. That problem should have been

noticed, but the fact is that it was not, and save for data mining, still would remain unnoticed. That particular adjunct has not been rehired.

Another serendipitous finding was that the failure rate of first semester students who took ADJ 100 was dismal, but no worse than those taking the equivalent introductory courses in psychology and sociology – failure rates approaching 60 percent. This has tremendous implications for college-wide advising and retention, but was unnoticed until now because there was no easy way for faculty to sort students out based on how many hours they had completed.

Some of the findings were as expected, e.g. that young males are a high risk group. These findings can be used to alert faculty to pay particular attention to that group and to work carefully to design courses with them in mind. It is anticipated that student services will be working their magic on these high risk students, perhaps with some effect.

PATHWAYS for the FUTURE

Immigration is changing the culture and the population in the Shenandoah Valley. Instead of a largely Scot-Irish population, the Valley now includes Hispanics, Russians, Kurds, Palestinians, and many others. We live in a social milieu undergoing tremendous change. A data mining product, such as CLEMENTINE, provides a means of tracking the effects of this and other changes in our milieu, both within the College and in the service area.

These findings represent, unfortunately, a work in progress. While this research team had hoped for a few hours of interaction, a bit of data churning, and a brief to-do list that would improve student success in the ADJ Program, that, of course, was not to be. What was found instead:

1. Faculty members who want serious help need to be prepared to develop a long term relationship with the staff in their IR office. Unless what the faculty member wants is numbers to pacify bureaucrats instead of to enhance programs, it will take a while.

2. The answers one gets depend on the questions one asks. Therefore, it helps if the faculty member has a clue about what he wants to find out. Of course, the questions asked will change as more information emerges, but one needs a place to start.

3. While IR types are usually helpful when it comes to number crunching, good analysis requires the interaction of IR staff and faculty. Teamwork improves the interpretation of findings, and the development of a 'pathway for the future.'

4. After mucking around in one's data, one is likely to find some interesting but unexpected relationships. No surprise there. What was a surprise was how many things a 'domain expert' can know before doing the analyses that the analyses contradicted. For example, the assumption was the most of the ADJ 100 students were part-time. Wrong. Age should be one of the best predictors. Wrong. Receipt of financial aid, and enrollment in developmental courses should be risk factors – not only are both these "facts" wrong, but some developmental and financial aid statuses actually are protective factors.

Number crunching can be a real pain, very hard on one's belief structure.

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Study Variables

Name	*Description*	*Field*
SSN	Student's social security number	9
age	the age of student for the selected term	2
sex	Indicates the student's sex 1 –male 2-female	1
race	Indicates student's race 1-caucasian 2-black 3-amer Indian 4-asian 5-hispanic 6-other	1
dvlpmntl	(devl) department of registration in developmental classes 0-none 1-eng only 2-mth only 3-other only 4-eng/mth only 5-eng/oth only 6-mth/oth only 7-eng/mth/oth	1
hsgradyr	Year student graduated from high school or GED	4
finaid	(fastatus) student's general financial aid status for the selected term 1-requested 2-mailed info 3-applied 4-awarded 5-received 6-none	1
fullpart	(load12)code for full-time or part-time load of 12 hours of credits	1
loader	Number of credits enrolled for the selected term	2
curric	(curcode) name of curriculum	40
arith	(tscore3) real range score for arithmetic placement test	3
algebra	(tscore4) real range score for algebra placement test	3
degree	(fdgtype) degree type 5-certificate 7-assoc art&sci	1

onoff	(onoffb) code to indicate if a student is on or off campus or both 0-on 1-off 2-both on and off campus	1
daynite	(dayniteb)Code to indicate if a student was day, night or both d-day n-night b-both	1
lastcoll	(lstcolnm)name of last college or university attended	30
jursdctn	(jurnam)name of jurisdiction	20
xferhrs	Credit hours a student transferred from other colleges	pd3.2
term	(clsyrtrm) year and term information for this semester	5
dept	code for each college dept	4
crsno	course number	3
sect	section of a class	2
grade	grade student received in course A,B,C,D,F,W,I	1
grdpt	grade points received for criminal justice course	1
gradegrp	Code to indicate successful or unsuccessful completion of selected criminal justice course 1-D,F,W 2-A,B,C	1
cumgpa	Grade point average (overall) = grade points (overall) / hours attempted (overall)	pd3.3
gpamod	Cumgpa less the selected criminal justice course grade points	pd3.3
cumhc	Number of credits student has successfully completed through the selected term	pd4.2
cumhcmod	Number of credits student has successfully complete less the selected criminal justice course through the selected term	pd4.2
cumgp	Sum of grade points for student through selected term	pd4.2
cumha	Overall number of credits a student has attempted to complete through the selected term	pd4.2
cumhamod	Overall number of credits a student has attempted to complete less the selected criminal justice course through the selected term	pd4.2
regcrhr	Credit hours for criminal justice class	1

dept1a	Dept for enrollment in additional criminal justice course for selected semester	4
crsno1a	Follows dept1a	3
sect1a	Follows crsno1a	2
grade1a	Follows sect1a	1
onlyclass	Code to indicate follow-up enrollment in criminal justice course	1
dept2a	Dept for enrollment in a criminal justice course in the semester following the selected semester	4
crsno2a	Follows dept2a	3
sect2a	Follows crsno2a	2
grade2a	Follows sect 2a	1
Group2	Code to indicate successful or unsuccessful completion of Follow-up criminal justice course 1-D,F,W 2-A,B,C	1
alggrp	Code to indicate 1-below threshold 2-above threshold 3-no alg score/SAT	1
arithgrp	Code to indicate 1-below threshold 2-above threshold 3-no arith score/SAT	1

Social activism

Positive relationship:

Race: Black
Race: Chicano

Faculty-student interaction
Student-student interaction
Number of years completed
Faculty social activism and community orientation
Mean socioeconomic status of peer group
Altruism and social activism peer factor
Discussing racial or ethnic issues with other students
Taking ethnic studies courses
Socializing with students from different ethnic or racial groups
Attending racial or cultural awareness workshops
Participating in campus demonstrations
Hours per week spent in volunteer work
Number of history courses taken
Number of writing-skills courses taken

Negative relationship:

Living at home
Number of mathematics and numerical courses taken

Status striving

Positive relationship:

Race: Black
Race: Chicano
Leaving college before start of second year
Interaction with faculty (talking with faculty outside of class, have been a guest in a professor's home, challenged a professor's ideas in class)
Interaction with students (discussed course content with students outside of class, studied with other students, socializing with friends)
High family income
Religious preference: Roman Catholic
Peer group value on materialism and status
Membership in sororities or fraternities
Drinking alcohol
Working at a full-time job
Hours spent partying
Number of math and numerical courses taken

Negative relationship:

Age
SAT Verbal scores
SAT Math scores
High School GPA
Gender: Female
Race: White
Peer group with high scientific orientation
High peer group score on permissiveness

Additional variables from 1998 CSS

Gender
Participated in leadership training
Participated in an internship program
Been elected to student office
Enrolled in honors or advanced courses
Participated in student government
Self-rated competitiveness
Self-rated drive to achieve
1998 probably careers
Discussed politics
Worked in a local, state or national political campaign
Visited a museum or art gallery
Hours per week reading for pleasure

Hours per week studying/homework
Hours per week student clubs/groups
Plans for fall 1998:
    Participating in community service organization
    Working for non-profit organization
    Doing volunteer work
    Working for a government agency

Developing a meaningful philosophy of life
Helping to promote racial understanding
Becoming a community leader

Enrollment full-time
Enrollment part-time

Women's studies courses
Attended a rape awareness workshop
Self-rated understanding of others
Felt overwhelmed by all I had to do

Performed volunteer service

Studied with someone of different racial/ethnic group
Dated someone from a different racial/ethnic group
Interacted with someone of a different racial/ethnic group in class
Dined with someone of a different racial/ethnic group

Support from college:
Encouragement to pursue graduate/professional school
Emotional support and encouragement
Intellectual challenge and stimulation

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